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# APHID FLIGHTS OBSERVED IN NEW BRUNSWICK*

BY R. P. GORHAM,

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The fact that most species of aphids at some time each year develop winged forms and that these winged aphids move from plant to plant is common knowledge. That the development of aphid infestations, on annual plants grown from seeds and on certain other plants commercially grown from cuttings of underground tubers, generally results from visits made by winged aphids is also well known. Certain of the aphids which are found on the potato plant have been proven to act as carriers of virus diseases from sick plants to healthy ones, and because of this the flight of aphids becomes of vital economic importance. The wingless forms of the aphids which feed upon the potato may move about from plant to plant in the field, but the distance they can travel is limited. No such limitation is placed upon the winged forms of these species, and they may move freely from field to field and from farm to farm. Born upon sick plants, feeding upon their sap during the period before wing development, and again as adults just before taking flight, these winged aphids are potentially disease vectors to any healthy plants upon which they may alight and colonize with progeny.

In the laboratory rearing at Fredericton, it has been found that more than fifty winged aphids of the species *Myzus persicae* Sulzer may be developed each day on one small potted potato plant. As an acre of potatoes contains some fourteen thousand plants, the number of aphids which may be produced on one single potato farm is very large.

An aphid survey conducted during the last six years has shown that, in certain districts of New Brunswick, heavy infestations of *Myzus persicae* Sulzer develop in the first week of August and begin to produce winged forms in large numbers. In other districts this species is not to be found in the first week of August, but it becomes abundant later in the month. Two mass flights of this species in association with *M. solanifolli* Ashmead have been observed by an experienced entomologist, A. E. McCollom, engaged in the work of the potato aphid survey.

In August, 1939, Mr. McCollom and Mr. W. S. Hoar of the Plant Inspection Service were assisting in the collection of samples of aphids from potatoes. In the early evening of August 19 at Perth, Victoria County, N. B., they noted a mass flight of aphids passing up the valley of the St. John at that place. A bridge crosses the St. John River connecting the towns of Perth and Andover which are some 500 feet apart. The aphids were passing this bridge in large numbers, some alighting on the girders and on the hands and clothing of the observers. After it became too dark to see the aphids in flight, they could still be seen alighting on the lighted shop windows of both towns. The collected specimens were *M. solanifolii* Ashmead and *M. persicae* Sulzer in almost equal numbers. On August 15, 1940, Mr. McCollom was fortunate enough to observe a similar mass flight at the same place. His report reads as follows: "At 7 p.m. against a setting sun a flight of aphids could be easily seen. It was not as large as that noted in 1939. Standing on the bridge they could be seen flying up river at

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a speed estimated at four miles per hour. The wind was very light. The heavier bodied aphids frequently alighted on the bridge girders but it was necessary to knock the lighter ones to the bridge floor to collect them. The flight extended the entire width of the river and I should judge that in a distance of twenty feet from the eye, as determined the distance one could clearly see individual insects, twenty or more aphids crossed the bridge per second. The flight continued until dark. After darkness from thirty to fifty aphids could be found on lighted store windows in Perth." The specimens collected were *M. solanifolli*, *M. persicae*, and one other species as yet unidentified.

In both 1939 and 1940, the collections made in the potato growing area north of Perth in the first half of August had shown aphids to be very scarce. Within a few days after observation of these flights of winged aphids, serious infestations developed in these northern potato fields.

## SOME OBSERVATIONS ON DIFFERENTIAL FEEDING ON MATURING WHEAT VARIETIES BY GRASSHOPPERS*

BY L. A. JACOBSON AND C. W. FARSTAD,

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Grasshopper damage to grain is usually considered as occurring almost entirely during the growing period immediately following seeding. There is, however, considerable damage during the period from first head emergence to maturity, which may be caused through leaf defoliation, cutting of heads, or actual feeding on the glumes and kernels. The dropping of heads is usually caused by migrating grasshoppers and is noticed throughout entire fields, causing a loss of what would have been harvestable grain.

In 1940 an experiment was designed to determine the effect of varietal resistance of wheat to feeding by Say's grain bug, *Chlorochroa sayi* Stal. Five plots were utilized, located in five different localities, all within a forty-mile radius of Lethbridge, Alberta. Each plot consisted of forty-one wheat varieties, sown in fifty-rod rows.[1] The varieties *Marquis* and *Renown* were replicated four times and *Mindum* twice in each plot. The seeding arrangement of each plot was randomized according to an experimental design to lend itself to statistical analysis. The wheat varieties used included fifteen grown domestically in Western Canada, a representative number of durums in addition to other varieties chosen for certain characteristics which make them valuable for breeding and selection purposes.

During August, 1940, heavy infestations of grasshoppers, composed almost entirely of *Melanoplus mexicanus mexicanus* (Saus.), were observed feeding in two of these plots. At that time Say's grain bug was scarce, and it was decided to make separate observations on the effect of grasshopper feeding on the varieties represented in the plots. Notes were made on the basis of the percentage of heads dropped in each row, in order that the analysis could be made on a quantitative basis. Only these two plots were considered, since the amount of head dropping in the remainder was not sufficient to show any differences.

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The varieties used, percentage of head dropping, and other data are shown in the following table.

Percentage of heads dropped by grasshoppers in two plots of forty-one wheat varieties, August, 1940

| Variety | Per cent head dropping, Series No. 1* | Series No. 2† | Mean | Variety | Per cent head dropping, Series No. 1* | Series No. 2† | Mean |
|---|---|---|---|---|---|---|---|
| Black Persian | 65.2 | 20.4 | 42.8 | Apex | 12.7 | 1.8 | 7.3 |
| Renown | 35.0 | 22.1 | 28.5 | Pilon Blanca | 12.3 | 1.8 | 7.1 |
| Mindum | 34.2 | 5.0 | 19.6 | Argentine | 10.7 | 9.9 | 10.3 |
| Prelude | 30.1 | 3.5 | 16.8 | Thatcher | 10.7 | 2.8 | 6.8 |
| Iumillo | 25.9 | 3.5 | 14.7 | Supreme | 10.0 | 2.0 | 6.0 |
| Caesium | 24.7 | 6.5 | 15.6 | Pelissier | 9.5 | 1.0 | 5.3 |
| Sivousska | 24.0 | 2.6 | 13.3 | Golden Ball | 9.0 | 0.7 | 4.9 |
| Kapledja | 23.1 | 1.8 | 12.5 | Girka | 8.7 | 2.0 | 4.9 |
| Reward | 22.3 | 12.0 | 17.2 | Komar | 8.1 | 2.6 | 5.4 |
| Ruskea | 22.2 | 5.0 | 13.6 | Iverday | 7.9 | 2.8 | 5.4 |
| Graecum | 22.0 | 0.3 | 14.3 | Comet | 7.4 | 1.0 | 4.2 |
| Marquis | 21.9 | 1.8 | 13.7 | Canus | 6.1 | 2.3 | 4.2 |
| Reliance | 20.9 | 0.3 | 10.1 | Speltiforme | 6.1 | 0.6 | 3.9 |
| 44.7 | 19.5 | 1.8 | 10.2 | S-615 | 5.2 | 0.6 | 2.9 |
| Pusa 52 | 19.3 | 0.3 | 9.8 | Lohmann's Weender | 3.8 | 4.8 | 4.3 |
| Tammi | 18.9 | 4.1 | 11.5 | Red Bobs | 3.2 | 2.0 | 2.6 |
| Garnet | 18.9 | 2.8 | 10.4 | Ceres | 1.3 | 2.0 | 1.7 |
| Regent | 16.2 | 2.6 | 9.4 | Dicklow | 1.0 | 1.3 | 1.7 |
| Chapinge | 15.7 | 3.5 | 9.6 | Rajah | 0.7 | 0.0 | 0.4 |
| Croesus | 15.2 | 1.8 | 8.5 | Nabawa | 0.5 | 0.0 | 0.3 |
| Barletta | 13.0 | 0.7 | 6.9 | Mean | 15.7 | 3.5 | 9.7 |

Standard deviation: Series 1—11.07, Series 2—4.5.

*Located at Barnwell, Alberta (plot 2). Grasshopper infestation, 15 per square yard.
†Located at Turin, Alberta (plot 3). Grasshopper infestation, 8 per square yard.

In the analysis of the results, several interesting points were brought out. The striking differences between the varieties are particularly significant when it is considered that the replicated varieties, *Marquis*, *Renown*, and *Mindum*, showed only slight differences within each of the plots. Contiguous rows showed sharp and distinct differences. There appeared to be no differences which could be associated with the position of any one variety with another in the plot. Despite the difference in severity of the infestations in the two plots, the varieties which were severely damaged in Series 1 were also the most severely damaged in Series 2 and in practically the same order.

The standard deviation of 11.07 and 4.5 in Series 1 and 2 respectively are not strikingly significant. Nevertheless, the constancy of damage severity warrants the hypothesis that varieties differ in the susceptibility or resistance to grasshopper feeding at the period during which these observations were made. Observations disclosed a distinct tendency toward two types of feeding, namely, head dropping and feeding on the glumes and kernels. The latter was particularly evident on the variety *Caesium*. In all plots where any grasshopper feeding occurred, this variety could be identified positively by severe feeding on the glumes and kernels. In practically all other varieties, this feeding was absent or negligible in comparison.

In conclusion, it should be mentioned that the results obtained were a separate part of another experiment and are not intended to be conclusive. The fact that small plots were used allowed for a greater freedom of selection by the grasshoppers, which might be altered when large plots were used. The data, however, are thought to be of value in presenting trends which may be of some significance in further investigation of the varietal resistance of wheat to grasshopper feeding.

# SOME APPARENTLY UNDESCRIBED COLEOPHORIDAE FROM THE OTTAWA REGION (LEPID.)*

BY J. McDUNNOUGH,

Ottawa, Ont.

In a recent paper (1940, Trans. Roy. Soc. Can. Sec. V, 53) I emphasized the importance of the genitalia in determining species in Group A of the genus *Coleophora*, i. e. (according to Barasch) those species in which the aedeagus is strengthened with lateral rods of chitin. In this large group it will frequently be found that several species possess an almost identical type of maculation and cannot satisfactorily be separated on this character alone with any degree of certainty; the genitalia in both sexes, however, provide excellent means of separation.

In the case of some of the older names, proposed largely by Chambers for species from Colorado and Texas, no certainty as to the identity can exist until such time as a careful study has been made of the genitalia of the types which, if they exist at all, should be in the Cambridge Museum of Comparative Zoology. Under such circumstances it becomes almost a necessity for the present to ignore Chambers' names where his meagre descriptions cannot be made to fit accurately and describe certain species as new. If good genitalic figures accompany the descriptions the species should be easily identified and eventual synonymy can be adjusted later. As has been often stated, notably by Mr. A. Busck, a good synonym is better than a doubtful determination.

In the light of the above remarks I venture to describe as new several species from the Ottawa district for which names have long been needed.

## **Coleophora sparsiatomella** n. sp.
(Figs. 1 & 4)

Palpi whitish, second joint with small apico-ventral tuft and the terminal half outwardly (including tuft) smoky brown. Head pale fawn (frequently whitish behind eyes). Antennae with basal joint thickened and clothed somewhat roughly with pale fawn, without, however, being tufted; other joints whitish, annulate with brown, at times rather obscurely. Thorax pale fawn. Primaries whitish with a faint creamy tint, with slight smoky shading at base, sparsely *sprinkled with scattered, blackish atoms*, notably along costa, through fold and terminally. Obscure, pale yellowish fawn, longitudinal streaks form the maculation as follows; A streak above fold from base to inner margin before apex, another streak below fold along vein 1, a third streak from middle of cell, forking three times, one fork to costa, a second to apex of wing and the third to inner margin before apex. Costal fringes faintly fawn brown, other fringes light smoky. Secondaries deep smoky with paler fringes. Legs creamy, femora shaded with smoky, hind tibiae with faint fawn-colored longitudinal streak and spurs on outer side deep smoky. Expanse 15-16 mm.

*Male Genitalia.* Sacculus with ventral margin bent inward apically forming a broad blunt tooth; caudal margin outwardly oblique, irregularly dentate, terminating in two blunt, subequal teeth. Clasper rather broad and chunky extending only shortly beyond apex of sacculus. Valvula rather weak, triangular. Gnathos long, conical. Aedeagus with the right rod very short and with a strong upright tooth preapically; the left rod broad, with strong upright tooth at two-thirds, following which it bends downward and gradually tapers. Vesica armed with a small cluster of more or less fused cornuti.

*Female Genitalia.* Genital plate rectangular, strongly raised centrally; caudal margin with a lateral, bluntly pointed tubercle (variable in size) and

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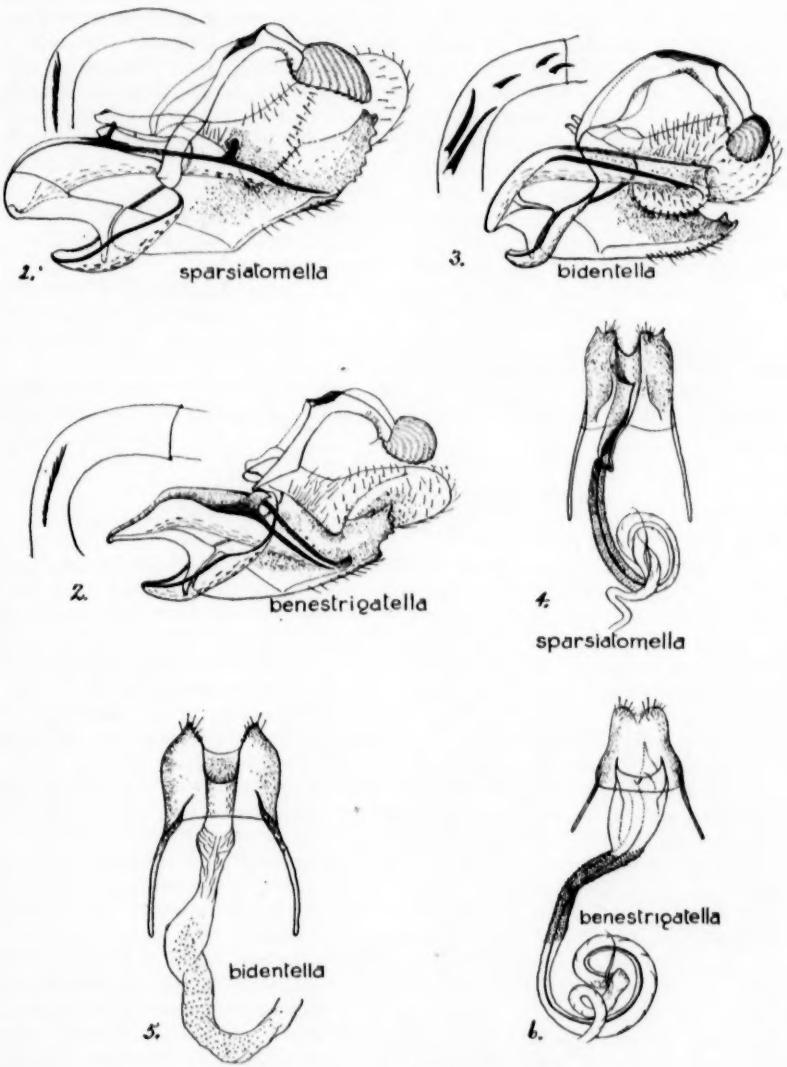
PLATE X.




UNDESCRIBED COLEOPHORIDAE

rounded setiferous lobes forming the sides of the deep, U-shaped ostium. Initial portion of ductus bursae tubular, weakly chitinized, directed slightly to left and terminating shortly beyond genital plate with a sharp, projecting bend to the right; it is armed internally by an irregular band of chitin, arising from the right side of the ostium. Beyond this a narrow, blackish, strongly spiculate section extends from left side of previous section in a weak curve to the first, large convolution, beyond which the ductus forms numerous small convolutions terminating in the bursa. A watch-spring-like band extends through the spiculate area almost to the end of the large convolution. The bursa is armed with a short, spiculate bar of chitin and a weak signum, represented by a short blunt hook arising from an expanded chitinous base.

*Holotype*—♂, Ottawa, Ont., Aug. 13, 1931, (C. H. Young); No. 5218 in the Canadian National Collection, Ottawa.

*Allotype*—♀, same data, Aug. 9.

*Paratypes*—11 ♂, same locality and collector, July 16, 18, 20; Aug. 7, 9, 10, 14, 16, 1931; Aug. 6, 22, 1932; July 29, 1933; 2 ♀, Aug. 15, 20, 1932; 1 ♀, Mer Bleue, Ottawa, Ont., July 26, 1934, (W. J. Brown).

The species is evidently widespread for, besides a couple of specimens in the collection from Hemmingford, Que., we have series from Indian Head and Saskatoon, Saskatchewan, and Jesmond and Kamloops, B. C. There is no data at present on the food-plant or case of the larva.

Worn specimens show little of the fawn striping, the color of primaries becoming a dull gray; they are however, easily determinable by reference to the genitalia.

### **Coleophora benestrigatella** n. sp.

(Figs. 2 & 6)

Palpi creamy; second joint with small ventro-apical tuft, shaded with fawn-brown outwardly except at base; third joint tinged with fawn ventrally. Antennae with basal joint somewhat enlarged and clothed with rough fawn hairs, other joints white, annulate alternately with light brown, fading apically. Head and thorax pale grayish. Primaries *without any smoky sprinkling*, creamy white, striped longitudinally with light brown (or light brown striped with white) the *stripes clearly and sharply defined* and the brown color predominating. The extreme costal edge is smoky brown in basal half; the white areas are as follows: The costa itself; a streak from near base of wing through cell, giving off three equidistant branches to costa, beyond the third branch being almost discontinued but faintly traceable to apex; a rather strong streak above the brown fold from base to beyond middle of inner margin; a much weaker streak below fold, generally fading out before reaching inner margin. Costal and apical fringes tinged with fawn-brown, other fringes deep smoky. Secondaries, including fringes, deep smoky. Hind tibia creamy, with a narrow, median longitudinal, fawn-brown stripe on outer side. Expanse, 14-16 mm.

*Male Genitalia.* Sacculus with scarcely an inward bend of ventral margin apically; caudal margin sharply excavated at junction with ventral margin, then somewhat outwardly oblique and irregularly dentate terminating in a strong, sharp tooth; behind this on dorsal margin is another slightly smaller tooth. Clasper rather narrow and extending well beyond apex of sacculus. Valvula well-developed, broadly rounded apically. Gnathos globular. Aedeagus broad and trough-shaped in basal half, its apical section on the left side is thickened with chitin which terminates in a large truncate projection arising from the centre of the trough. Beyond this the aedeagus narrows and bends sharply downward, the armature of both sides consisting of narrow rods of chitin; the left rod is rather the shorter and terminates in a point, the right rod is armed

apically with a broad flat tooth, bent to the right. Vesica armed with a small cluster of more or less fused cornuti.

*Female Genitalia.* Genital plate broadly cone-shaped; caudal margin broadly bilobed, the lobes well-rounded, weakly setiferous, and separated by a deep V-shaped median excavation. Ostium situated near the cephalic margin of plate, broad, semicular. The membranous, initial portion of the ductus bursae as broad as ostium at its inception, extending well beyond cephalic margin of plate and narrowing gradually; it is followed by a dark, narrow, strongly spiculate section. This in turn gives rise to a membranous tube which forms a single large convolution and then in numerous smaller convolutions continues, faintly spiculate, to the bursa; this is armed with a weak spiculate bar of chitin and a signum consisting of a thin curved hook arising from a triangularly expanded base.

*Holotype*—♂, Norway Bay, Que., July 21, 1939, (E. G. Lester); No. 5219 in the Canadian National Collection, Ottawa.

*Allotype*—♀, Ottawa, Ont., Aug. 17, 1905, (C. H. Young).

*Paratypes*—1 ♂, same data as Holotype; 1 ♂, Norway Bay, Que., June 2, 1939, (G. A. Hobbs); 3 ♂, 2 ♀, Ottawa, Ont., May 22, June 16, 17, 19, July 9, 1905, (C. H. Young); 7 ♂, 5 ♀, Meach Lake, Que., June 23, 25, 28, 30, 1941, (G. A. Hobbs).

Judging by the dates it would appear as if the species was double-brooded. Nothing is known of the larval case or food-plant. In maculation there is considerable resemblance to *cratipennella* Clem., but the species possesses totally different genitalia.

**Coleophora bidentella** n. sp.
(Figs. 3 & 5)

Palpi white, shaded on outer side with smoky; second joint tufted apically. Antennae white, annulate distinctly with brown, basal joint slightly enlarged and clothed with light gray scaling. Head light gray; thorax largely whitish with some gray suffusion. Primaries fawn-brown, streaked longitudinally with pure white and *without any smoky sprinkling.* The white areas are as follows: A rather broad streak along costa from base to apex, including the costal fringes; three fine oblique streaks to costa in outer half of wing, not noticeably conjoined basally and traces of a fourth streak to apex of wing; a broad streak from base through fold, not quite attaining inner margin well beyond middle and bisected by a fine brown hair line, the lower half of the streak tending to fade away in outer section; white shading above inner margin at base, the extreme margin being narrowly white in outer two-thirds at base of light smoky fringes. Secondaries pale smoky with fringes slightly paler. . Hind tibiae white with a faint median, longitudinal, brown streak, tarsi light smoky brown, mixed with white scaling. Expanse, 14-15 mm.

*Male Genitalia.* Sacculus with ventral margin without inward tooth, merging in a gentle upward curve into caudal margin which terminates in a couple of strong teeth placed one behind the other on dorsal margin. Clasper broad, chunky, extending only slightly beyond the apex of sacculus. Valvula broad and strongly setose. Gnathos globular. Aedeagus with the narrow chitinous rods of each side equal, terminating in fine, slightly downcurved hooks and each with a preapical flat triangular tooth. Vesica armed with two long narrow cornuti, followed distad by three (at times four) chunkier ones.

*Female Genitalia.* Genital plate rectangular, the lateral edges somewhat incurved caudad and terminating in sharp points; caudal margin strongly excavated, the inner margin of each lobe irregularly dentate. Ostium situated about middle of plate, semicircular, with weakly setose margin. The initial portion of the ductus bursae a narrow cylinder, as broad as ostium, extending to just beyond cephalic edge of genital plate, merging into a short, slightly

expanded, crinkly, membranous section which in its turn is followed by a broader, irregularly twisted and very weakly spiculate tube extending to the bursa; *no strongly spiculate, dark area* as in preceding species. Bursa with a very weak, spiculate rod of chitin and a short, thin signum, arising from a very broad, semicircular, chitinous base. Gonapophyses much stouter than usual.

*Holotype*—♂, Meach Lake, Que., June 13, 1907, (C. H. Young); No. 5220 in the Canadian National Collection, Ottawa.

*Allotype*—♀, Covey Hill, Que., June 29, 1927, (W. J. Brown).

*Paratypes*—2 ♂, Hemmingford, Que., June 28, 1925, (G. H. Hammond); 1 ♂, Ottawa, Ont., June 19, 1905, (C. H. Young); 1 ♂, Aweme, Man., May 21, 1925, (N. Criddle).

## SOME NEW AND LITTLE KNOWN CANADIAN ICHNEUMONIDAE (HYMENOPTERA) *

BY G. STUART WALLEY,

Ottawa, Ont.

### **Pimpla silvicola** n. sp.

Resembles *ellopiae* Hgtn. in structure and sculpture, but with abdomen entirely black, not red as in that species. In Cushman's† and Townes's‡ synopses it traces to *sodalis* Ruthe, which it resembles in color, but from which it differs in its rounded, rather strongly receding temples, shorter malar space, narrower ocellocular space, very narrow epipleura of abdominal segments two, three, and four, the absence of median longitudinal propodeal carinae, and the much paler color of the wings. In *sodalis* the temples are almose straight and scarcely receding for some distance behind the eyes, the malar space is slightly greater than the basal width of a mandible, the ocellocular space is distinctly greater than the diameter of an ocellus, the epipleura of the second and third abdominal segments are narrow, with those of the fourth distinctly broader, the propodeum has a pair of short, diverging, median longitudinal carinae at its base, and the wings are rather strongly infuscate.

*Female.* Length 9.5 mm.; antennae 9 mm.; wing 9 mm.; sheath 3 mm.; ovipositor 4.5 mm. Head narrow behind eyes; temples rounded and receding at an angle of about 45 degrees; malar space a little less than width of mandible at base; ocellocular space distinctly less than diameter of lateral ocellus; face rather densely punctate and with a median longitudinal ridge; clypeus smooth, punctate only along base, free margin with a distinct median emargination; antennae slender, basal segment of flagellum approximately ten times as long as thick at middle.

Thorax shining; pronotum in greater part, mesopleura posteriorly below, and metapleura throughout, finely rugulose; remainder of mesopleura except speculum with numerous rather large punctures; mesoscutum with finer, denser, shallower punctures; scutellum with sparse, poorly defined punctures; sides of propodeum and anterior two-thirds above rather strongly transversely rugulose, median posterior portion smooth and shining; median carinae of propodeum absent.

First tergite with a shallow, smooth concavity anteriorly; remainder of first tergite and tergites 2 to 5 rather densely punctate, with their apices impunc-

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*Contribution No. 2109, Division of Entomology, Science Service, Department of Agriculture, Ottawa.

†Proc. U. S. N. M., Vol. 58, 330, 1920.

‡Ann. Ent. Soc. Am., Vol. 33, 299, 1940.

tate, subcallose; apical tergites subpolished; epipleura of second, third and fourth segments narrow throughout; sheath about one-half as long as abdomen.

Body black, as are also the coxae and trochanters except apices of latter; legs reddish beyond tronchanters but with front and middle femora tinged with piceous on their lower surfaces and hind femur narrowly blackish at apex; hind tibia dull red, shading to blackish on apical half; hind tarsus blackish with a reddish tinge; antennae and tegulae black; wings with a dusky tinge, venation dark brown.

*Male.* Resembles the female in structure and color, but with tegulae sordid whitish with apices blackish, whereas in the female the tegulae are uniformly black.

*Holotype.* ♀, Steelhead, B. C., June 19, 1933 (H. B. Leech); No. 5193 in Canadian National Collection, Ottawa, Ont.

*Allotype.* ♂, Boyer, Ore., July 21, 1935.

*Paratypes.* ♀, Steelhead, B. C., June 2, 1933 (H. B. Leech); ♀, Mystery Glacier, B. C. 4000 ft. (on ice) Aug. 6, 1927 (Mundy Coll.); 4 ♂♂, 9 ♀♀, Boyer Ore., (dates ranging from Apr. 27 to Sept. 10); ♂, ♀, Corvallis, Ore., June 26, 1929, (Robert L. West), Aug. 7, 1925 (D. G. Gillespie); ♀, Waldport, Ore., June 5, 1925 (J. E. Davis); ♀, Friday Harbor, Wash., June 29, 1906 (J. M. Aldrich).

Allotype and paratypes No. 55440 in United States National Museum.

### **Pimpla sodalis** Ruthe

*Pimpla sodalis* Ruthe, Stettin. Ent. Zeit. 20, 371, 1859.
*Ephialtes sodalis* (Ruthe) Cushman, Proc. U. S. N. M., 58, 332, 1920.
*Pimpla sodalis* Ruthe, Townes, Ann. Ent. Soc. Amer., XXXIII, 300, 1940.

A single female of this species is at hand from Lake Harbour, Baffin Island, Aug. 6, 1935 (W. J. Brown).

### **Allocota sheppardi** n. sp.

Resembles (*Hemiteles*) *Allocota conspicuus* (Cress.) but is distinctly stouter bodied than that species. The type of *conspicuus* does not have the abdomen black at the apex, whereas in the present species part of the third tergite and the entire following tergites are black. Both species differ from *Allocota thyridopterigis* (Riley) in lacking prominent propodeal processes in the female.

*Female.* Length 7 mm. Head transverse, temples feebly curved and very strongly receding; face with sparse punctures; clypeus shining, with a few punctures, its free margin somewhat produced at middle; malar space slightly greater than basal width of mandible; antennae 30-segmented, first two flagellar segments of equal length, third segment slightly shorter than second.

Mesoscutum rather shining; notaulices distinct, finely foveolate; lobes of mesoscutum more or less finely transversely rugulose adjacent notaulices, shallowly punctate-reticulate near posterior limits of notaulices, otherwise faintly granularly sculptured; sides of pronotum, mesopleura except speculum and metapleura, densely rugulose-punctate, the punctures shallow and often confused, less dense on upper metapleura; scutellum polished, impunctate; propodeum completely areolate, areola narrowing in front of costulae; regions before costulae obliquely rugulose; behind costulae smoother and with scattered obsolete punctures; more strongly punctate and rugulose adjacent metapleura and in petiolarea; first intercubitus obsolete; nervulus interstitial; discoidella emitted at posterior third of nervellus.

Abdomen as long as head and thorax combined; sheath of ovipositor a little longer than first abdominal segment; first tergite about two-thirds as broad

at apex as long; second and third tergites of equal length with sides gradually diverging, second tergite two-thirds as long as broad at apex; first three tergites evenly longitudinally rugose, with apex of post petiole and apical one-third of second and third tergites and the following tergites entirely polished.

Body and legs rather light reddish-brown except as follows: flagellar segments 6 to 9 sordid yellowish, segments beyond dark brownish-black; basal segments of palpi, line along middle of mesosternum, and posterior margin of same fuscous; tips of all tarsi and upper surface of middle and hind tibiae with blackish suffusion; basal two-thirds of third tergite except at sides brownish-black; all following tergites black, occasionally with a rufo-piceous tinge. Wings conspicuously trifasciate with dark brown as follows: a broad basal band before basal vein and nervulus, a broad median band extending from base of stigma to apical third of radial cell, and a very narrow paler apical band beyond apex of radial cell; hind wing with a pale brownish band beyond basella and the posterior margin of anellan cell somewhat brownish.

*Holotype.* ♀, Shawbridge, Que., Aug. 20, 1937 (A. C. Sheppard); No. 5194 in Canadian National Collection, Ottawa, Ont.

*Paratypes.* 2 ♀ ♀, Shawbridge, Que., July 6, Sept. 2, 1937 (A. C. Sheppard); ♀, Mer Bleue (near Ottawa) Ont., June 6, 1927, (G. S. Walley). Paratype in United States National Museum.

*Host.* The specimens from Shawbridge, Que., emerged from cases of a species of psychid. Moths reared from additional similar cases by Mr. Sheppard have been identified by Mr. T. N. Freeman as an undescribed species of *Hyaloscotes.*

### **Trichocryptus bicolor** Cush.

*Trichocryptus bicolor* Cushman, Proc. U. S. N. M., 72, Art. 13, p. 8, 1927.

Four females are at hand in the National Collection from Pike Lake, Saskatchewan, May 24, 1940 (A. R. Brooks). The species was described by Cushman from a female specimen taken at Sprague, Washington.

### **Cylloceria nodosa** n. sp.

*Cylloceria lugubris* Cress. and the present species differ from all other described North American species in having the coxae and trochanters black instead of red. The female of *nodosa* differs from that of *lugubris* and other species in having much shorter antenna, with the terminal flagellar segment distinctly swollen and noticeably thicker than the preceding segments. The male of *nodosa* has white tegulae, whereas in *lugubris* the tegulae are black. In both sexes of *nodosa* the tarsal claws are unusually long and slender and distinctly less strongly curved than in *lugubris* and the other species.

*Female.* Length 7 mm.; antennae 5 mm.; sheath 3 mm. Temples evenly rounded, moderately receding; face twice as broad as long; genae in front view rather long, convex; malar space equal to basal width of mandible; ocellocular space one and one-half times diameter of a lateral ocellus; facial punctures more or less confused by short irregular rugulae; genae, more or less of frons, and sides of vertex finely sculptured; middle of vertex and most of temples more shining and rather densely punctate; antenna 21-segmented, with lengths of three basal segments of flagellum in proportions 8:5:4; basal flagellar segments slender, the first 11 times as long as thick at middle; apical 4 or 5 segments thicker than those preceding, subapical segment short, not longer than broad, apical segment distinctly thicker and about twice as long as the preceding segment.

Pronotum mostly finely irregularly rugulose; mesoscutum, scutellum and mesopleura smooth and shining, with scattered punctures which are densest on the anterior portion of the mesoscutum; metapleura and propodeum dullish, the entire surface with numerous, irregular, reticulating rugulae; longitudinal propodeal carinae distinct, the median pair sharply elevated, lateral pair more ridge-like and weaker anteriorly.

Abdomen rather stout; first tergite as broad at apex as long, the median portion in region of spiracles tumidly elevated, the elevation surmounted by a pair of weak longitudinal carinae; first tergite dull, sculptured like propodeum; second tergite distinctly longer than broad at base, similarly but more finely sculptured than first tergite, especially on apical half; third tergite with only fine sculpture at base; abdomen beyond smooth and shining.

Black; apices of mandibles and palpi dark reddish-brown; apices of second, third and fourth abdominal tergites narrowly rufo-piceous; coxae and trochanters black, femora reddish, tibiae and tarsi reddish-brown, the latter more or less infuscate especially apically; tegulae black; stigma and veins dark brown, wing membrane tinged with brown.

*Male.* Structure in general as in female. Antenna 27-segmented, slender throughout, basal angle of emargination of third flagellar segment slightly acute and prominent (somewhat obtuse and less prominent in *lugubris*); abdomen more slender than in female; first tergite distinctly longer than broad at apex, the distance from spiracle to apex equal to width at apex, without a distinct tumid area between spiracles, the latter rather prominent.

Color as in female except as follows: palpi sordid yellowish-brown; front and middle trochanters more or less reddish-brown at apices; tegulae whitish.

*Holotype.* ♀, Churchill, Man., July 23, 1937 (W. J. Brown); No. 5198 in Canadian National Collection, Ottawa, Ont.

*Allotype.* ♂, Churchill, Man., July 9, 1937 (W. J. Brown).

*Paratypes.* 7 ♂♂, ♀, same data as allotype, except ♂ July 6; ♀, Healy, Alaska, July 7, 1921 (J. M. Aldrich), from Coll. U. S. N. M. Paratypes in Collection of United States National Museum.

## **Ctenopelma croceum** n. sp.

Resembles *C. sanguineum* (Prov.) but readily distinguishable from that species by the paler, more yellow colored body and the less completely areolate propodeum. In *sanguineum* the body is a dull reddish-brown, except for certain paler markings, and the propodeum has complete, well defined median and lateral longitudinal carinae, the basal area and areola are confluent, but the latter is separated from the petiolarea by a strong transverse carina; only the costulae are lacking.

*Female.* Length 9.5 mm.; antennae 9 mm. Temples rounded, only moderately receding; ocellocular space equal to one and one-third times diameter of a lateral ocellus; face dullish, with fine, even, granular sculpture and rather sparse punctures, the intervals between punctures equal to two or three times the diameter of a puncture; antennae 35-segmented, slender, all segments of flagellum distinctly longer than broad.

Pronotum polished, with a few minute punctures, groove of pronotum smooth except for short epomia; mesoscutum polished, sparsely minutely punctate; mesopleura highly polished with very few punctures; propodeum polished, with small, sparse punctures; median longitudinal carinae weakly elevated and subparallel on basal half of propodeum, beyond diverging and more elevated to become strongly elevated in apical sector; petiolarea, areola, and basal area confluent; third lateral area well defined; lateral carina represented only by a short spur from the apical transverse carina; costulae absent; pleural carina strong and complete.

Spiracle of first abdominal tergite situated a little beyond middle, with an obtuse ridge but scarcely a distinct carina before and beyond spiracle; abdomen polished, with only sparse minute punctures.

General color yellowish-ochraceous to light tawny, with the face, clypeus,

mouth parts, orbits, tegulae, sub-alar tubercles, and scutella pale yellowish; apices of front and middle femora, and four anterior tibiae and tarsi, rather pale yellowish; wings lightly tinged with testaceous-brown, stigma dull yellowish, veins mostly pale brown.

*Male.* Similar to female but with yellowish markings more extensive. In addition to the yellow areas noted above, the male has the entire mesosternum, propleura, more or less of the pronotum, the lower mesopleura, and the front and middle legs pale yellow.

*Holotype.* ♀, Sweetsburg, Que., July 6, 1936 (G. S. Walley); No. 5195 in Canadian National Collection, Ottawa, Ont.

*Allotype.* ♂, same data as holotype.

*Paratypes.* 2 ♂♂, Sweetsburg, Que., July 7, 1936 (G. S. Walley); ♂, ♀, Knowlton, Que., June 15, 1936, July 13, 1936 (G. S. Walley); ♀, Ile de Montreal, Que., June 17, 1906 (Beaulieu); ♂, Wright, Que., June 10, 1935 (G. S. Walley); 2 ♂♂, Bobcaygeon, Ont., June 26 (J. McDunnough). Paratypes in United States National Museum.

### **Ctenopelma crassicorne** n. sp.

The present species differs from *C. sanguineum* (Prov.) and *C. croceum* n. sp. in having the antennae distinctly shorter and stouter, the segments of the apical half of the flagellum being distinctly broader than long, the shortest being almost twice as broad as long, whereas in the above two species even the shortest segments are a little longer than broad. It differs further from both the above species in having the body less shining and more strongly sculptured especially the first two abdominal tergites, and it agrees with *sanguineum* and differs from *croceum* in the development and arrangement of propodeal carinae. In its even, dull reddish-brown body color, *crassicorne* agrees with *sanguinea* but in the former the face of the female is yellowish only at the sides and the antennae are more conspicuously yellowish apically.

*Female.* Length 9 mm.; antennae 7 mm. Temples rounded, only slightly receding; ocellocular space equal to one and one-half times diameter of a lateral ocellus; face shining, moderately densely punctate, finely granular at sides; frons largely finely granular, with scattered shallow punctures; antennae 33-segmented, flagellum slender at base, thickest in portion beyond middle, tapering slightly toward apex; basal 8 or 9 segments of flagellum as long or longer than broad, the following segments, except the last, all broader than long, the stoutest segments (segments 20-30) almost twice as broad as long.

Thorax very similar to that of *sanguineum* but a little more strongly punctate, notaulices better defined and metapleura somewhat more roughened; propodeum shorter than in *sanguineum*, with the same arrangement of carinae, the areas consequently a little broader in proportion to their length, the combined basal area and areola distinctly shorter than twice its greatest width (in *sanguineum* about three times as long as broad); legs, especially the hind tibiae, a little shorter and stouter than in *sanguineum*.

First two and base of third abdominal tergites dullish, finely, evenly roughened, with numerous shallow punctures, the sculpture strongest on the basal tergite; remainder of abdomen polished, with only sparse very minute punctures.

General color reddish-brown, very similar to *sanguineum*, sides of face dull yellowish, apical 16 segments of flagellum yellow; tibia beset with numerous blackish spines.

*Male.* Very similar to female in structure and color. Differs from the female in having the entire face and clypeus yellow and the wing with a dusky tinge at apex.

*Holotype.* ♀, Smoky Falls, Mattagami River, (near Kapuskasing) Ont., June 13, 1934 (G. S. Walley); No. 5196 in Canadian National Collection, Ottawa, Ont.

*Allotype.* ♂, Constance Bay (Carleton Co.) Ont., April 29, 1941 (G. S. Walley).

## **Casinaria eupitheciae** Vier.

*Casinaria eupitheciae* Viereck, Proc. U. S. N. M., XLIII, 586, 1912.
*Campoplex (Hypothereutes) impetitus* Viereck, Can. Ent., LVII, 204, 1925; LVIII, 223, 1926. (new synonymy).

A female specimen of *eupitheciae* from North East, Pa., supplied to me by Mr. R. A. Cushman, agrees with the type of *impetitus* which is in the Canadian National Collection.

The following characteristics of *eupitheciae* are of special value in distinguishing it from the new species described below.

Antennae rather short, 25-segmented; flagellar segments as long or longer than broad excepting segments 12 to 16 which are a little shorter than their width; malar space not quite equal to one-third basal width of mandible; head rather thin; ocelli small, greatest diameter of lateral ocellus only a little more than ocellocular space.

Abdominal tergites uniformly black; hind tibia narrowly pale at base, beyond dull reddish-brown, slightly darker near base and on apex above, but without the appearance of being definitely banded.

## **Casinaria semiothisae** n. sp.

Resembles *eupitheciae* but with antennae a little more slender, head slightly thinner, larger ocelli, narrower ocellocular space, more contrastingly colored hind tibia, and with some of the abdominal tergites more or less marked with dull reddish.

*Female.* Length 6 mm. Head thin, temples rounded, strongly receding; antennae 29-segmented, all flagellar segments at least a little longer than broad; malar space scarcely equal to one-fifth basal width of mandible; ocelli unusually large, greatest diameter of lateral ocellus almost twice as great as ocellocular space and three-fourths as great as post-ocellar line; head and thorax dull, with granular sculpture.

Mesoscutum and scutellum densely, shallowly punctate, the punctures somewhat obscured by the granular sculpture; mesopleura and metapleura less heavily sculptured and with fewer punctures; propodeum with well defined, regular, median longitudinal carinae, lateral longitudinal carinae distinct but not quite as strong as median, costulae present but incomplete; propodeum somewhat punctate and finely, irregularly rugulose in lateral and pleural areas; combined areola-petiolarea more coarsely, transversely rugulose, and with a median longitudinal sulcus.

Second abdominal tergite a little less than twice as long as broad at apex; abdomen only weakly compressed beyond second segment; sheath short and rather slender; areolet small, petiolate; nervulus slightly post-furcal; nervellus perpendicular.

Black; scape and pedicel yellowish-brown on lower surface; mandibles except apices, palpi, tegulae, and extreme base of wing yellow; stigma and veins dark brown; front and middle coxae pale reddish, blackish at extreme base; hind coxa and basal segment of hind trochanter black; front and middle trochanters, extreme apex of front and middle femora, front and middle tarsi on upper surface, entire four anterior tarsi, and base of hind basi-tarsus rather pale yellowish; all femora and ventral surface of four anterior tibiae reddish;

hind femur with a small fuscous spot at apex above; hind tibia with a narrow yellowish annulus at base, beyond which is a slightly broader brownish band followed by a yellowish stripe above which shades to pale reddish below, approximately the apical two-fifths of tibia brownish except along the lower surface which is reddish and continuous with the median portion; hind tarsi brown except at base; abdomen black; second tergite obscurely rufopiceous at apex; third tergite with a large, dark, triangular, reddish suffusion laterally beyond spiracle; fourth tergite with lateral region almost entirely paler reddish; fifth tergite with a smaller, darker, reddish suffusion on side; following tergites with only traces of dark reddish; venter pale dull brown, apices of sternites yellowish.

*Male.* Very similar to female in structure and color. The male usually has a small reddish-brown mark on the apex of the hind coxa above.

*Holotype.* ♀, Mattawa, Ont., (Forest Insect Survey, No. 2614A), reared in laboratory, emerged Mar. 21, 1938; No. 5197 in Canadian National Collection, Ottawa, Ont.

*Allotype.* ♂, Mattawa, Ont. (Forest Insect Survey, No. 2287B), reared in laboratory, emerged Mar. 20, 1938.

*Paratypes.* 16 ♂♂, 28 ♀♀, from the following localities: ONTARIO: Chalk River, Chapleau, Espanola, Hearst, Kapuskasing, Mattawa, Nakina, Port Arthur, Skead, Stonecliff, Whitney; QUEBEC: Cascades, Farrellton, McGregor Lake, Maniwaki, Mont Laurier, Poltimore, Parent, St. Theodore, Senneterre, Shipshaw, Val des Bois. All the above mentioned paratypes were reared in the laboratory by officers of the Forest Insect Survey staff, the adults emerging on various dates during February and March in the years 1937, 1938 and 1939. Paratypes in United States National Museum.

*Host.* All the above mentioned type material was reared from larvae of *Semiothisa granitata* Gn.

*Remarks.* The type series has been chosen from specimens reared from *Semiothisa granitata* from localities in Ontario and Quebec, but the National Collection also contains single examples reared from the same host from the following localities: Lunenburg and Queens Counties, Nova Scotia; Carleton and Northumberlan Counties, New Brunswick, Barriere and New Westminster, British Columbia. Four specimens reared from larvae of *Semiothisa sexmaculata* Pack. from Nipawin, Prairie River, and Ushta Siding, Saskatchewan, are also in the National Collection. There are seven specimens reared from larvae of *Semiothisa bisignata* Wlk. from Brockville, Massey, Napanee, and Port Arthur, Ontario, in the National Collection, which I would refer to this species since they appear to differ from the series reared from *Semiothisa granitata* only in having the abdominal tergites beyond the second with the reddish color predominating, the black being reduced to a triangular area at the base of each tergite. In none of the specimens in the type series is there so much reddish on the abdomen, however there is some variation in this respect. While the majority of the specimens are very similar to the holotype, others have the apex of the second tergite narrowly, and the apices of the third and fourth tergites rather broadly, banded with reddish and have the sides of the latter two tergites almost entirely reddish.

### **Dolichopselephus cockerelli** Ashm.

*Dolichopselephus cockerelli* Ashmead. Bul. No. I of the Colorado Biological Association, p. 23, 1890; Cushman, Proc. U. S. N. M. 53, 508, 1917.

A female of this species collected on prairie plots at Saskatoon, Saskatchewan, Aug. 5, 1925 (Kenneth M. King) is in the National Collection. The species was originally described from a single female from Smith's Park, Colorado, and for it Ashmead proposed his genus *Dolichopselephus* (op. cit.). No further records for the species appear to have been published.

# *ONCOCNEMIS RIPARIA* MORR. AND ITS RACES*

BY J. McDUNNOUGH,
Ottawa, Ont.

I have recently studied considerable material from various parts of the North American continent which has been distributed under the names *riparia* Morr., *major* Grt. or *aqualis* Grt. and have come to the conclusion that we are dealing with a single variable and wide-spread species, showing considerable tendency to break up into more or less constant local races, distinguished from each other by minor points of maculation and color and also by certain slight differences in the male genitalia which, however, to my mind, are not sufficient to warrant specific status. *Curvicollis* Grt., which was formerly included in the group, but now listed separately, may be definitely considered as a good species, occuring in New Mexico and Arizona; the male genitalia are distinct from those of *riparia*, as was pointed to me (*in litt.*) by Mr. J. F. Gates Clarke of the United States National Museum with whose opinion I agree.

In the following remarks I deal briefly with the nimotypical form and its races.

## **O. riparia** Morr.

Inadequately described as an eastern variety of *chandleri* Grt. from material collected by F. Tepper at Locust Valley, Long Island, N. Y., *riparia* was so listed by Grote for a number of years. Smith first pointed out in his *Oncocnemis* revision (1889, Trans Am. Ent. Soc., XVI, 342-3) its distinctness from *chandleri* and its close relationship to *major* Grt.; he gave what turns out to be a very accurate description and separated it as a species from *major* on the strength of the lighter-colored primaries and the distinctly pale-ringed ordinary spots. The holotype male must be considered to be in the Tepper Collection, now at East Lansing, Mich., and I have recently received an excellent photograph of this through the courtesy of Professor R. Hutson. The so-called "type" in the British Museum, *ex* Grote Collection, may be one of the type series, received later from Tepper; Hampson's figure is not particularly good when compared with the photograph but does show the points brought out by Smith and to this might be added the rather important character (mentioned by Smith in his description) that the *dark arrow-marks preceding the s. t. line are* edged with white, especially in the interspaces between veins 3 and 4 and 6 and 7, where they extend as long narrow triangles almost to the outer margin; the usual cross-lines are obsolescent.

From J. G. Franclemont of Cornell University I have received a topotypical male specimen from Riverside, Long Island, which agrees excellently with the above diagnosis and from this specimen I figure the right clasper (fig. 1). I imagine the typical race will be found to be restricted to the coastal region of the Northern Atlantic and New England States. Grote mentions specimens from the vicinity of Buffalo, N. Y.; judging by a small series before me from Pt. Colborne, Ont., such specimens are not typical but approach more closely in maculation to a Manitoba form which I shall discuss later.

## **O. riparia** var. **major** Grt.

The name *major* was based on two female Colorado specimens. One of these is in the British Museum and is figured by Hampson; the other, now in the United States National Museum, *ex* Neumoegen Collection, I have recently examined. This latter specimen is in poor condition but bears out Smith's remarks as to the points which distinguish *major* from *riparia*. It is probable that the original types were collected at Glenwood Springs, Colo., by Bruce; from a male from this locality I figure the right clasper (fig. 4) which is slightly narrower than in *riparia;* the main distinction is found in the harpe

*Contribution No. 2070, Division of Entomology, Science Service, Department of Agriculture, Ottawa.

which is narrower and somewhat more obliquely placed on the clasper; this slight difference I do not, however, consider specific, and indeed it may not even be entirely constant, although other specimens from Utah (Eureka), Montana (Bozeman) and Alberta (Lethbridge) show a similar type of harpe, as well as agreeing in type of maculation. In general *major* is distinguished by the deep smoky gray color of the primaries and the indistinct maculation, neither the basal black dash nor the ordinary spots being prominent and only faintly white-margined; the cross-lines are usually indistinctly visible; the dark arrow-marks preceding the s. t. line show little or none of the white edging so characteristic in *riparia*. The secondaries of the males in the pale semi-hyaline basal section tend to be more suffused with brownish than in *riparia* males.

### **O. riparia** var. **aqualis** Grt.

The description was based on a single California female (locality of type given by Hampson as Salidah) and calls for a specimen in which on the primaries the white s. t. line is entirely missing and the dark terminal streaks in consequence unbroken. I have a single female before me from Providence Mts., S. Bernardino Co., Calif., which matches this diagnosis; otherwise the specimen is quite similar to *major*, the color of primaries a rather even, deep smoky gray with maculation obsolescent, except a prominent dark basal streak. The hindwings are paler and more opalescent than in *major* females. A small series, mostly females, from the southern interior of British Columbia resembles the above Californian specimen closely, but most of the specimens show at least faint traces of the white s. t. line and the basal streak is less obvious. I am placing them provisionally under *aqualis*. The genitalia of my single male from Seton Lake shows slight differences in the shape of the harpe as a reference to the figure (fig. 5) will make plain.

The correct status of *aqualis* will have to await more Californian specimens, especially males; it has generally been treated as a slight form of *major* but in view of the locality I am inclined for the present to give it subspecific rank.

### **O. riparia** var. **manitoba** var. nov.

Primaries a deep brownish, rather heavily suffused with gray scaling. Maculation well defined. The basal streak is reduced to a fine hair-line faintly bordered with white and terminating in a white loop representing the claviform; the other spots are outlined in white. The main points of distinction from typical *riparia* are that the cross-lines, especially the t. p. line, are quite prominent and that the dark arrow-marks preceding the irregular, white, s. t. line are *not bordered with white*, the strigate appearance in this area being, in consequence, lacking. The hindwings in the basal two-thirds are slightly tinged with brownish. In the male genitalia the clasper is broad and chunky as in *riparia*, but there is a slight difference in the shape of the harpe, best understood by referring to the figure. (fig. 3).

*Holotype*—♂, Aweme, Man., July 13, 1904, (J. Fletcher); No. 5214 in the Canadian National Collection, Ottawa.

*Allotype*—♀, Aweme, Man., July 21, 1905, (N. Criddle).

*Paratypes*—13 ♂, 1 ♀, same locality, taken in various years by N. and E. Criddle between 1910 and 1920, the earliest date being June 23, the latest July 17.

### **O. riparia** var. **subterminalis** var. nov.

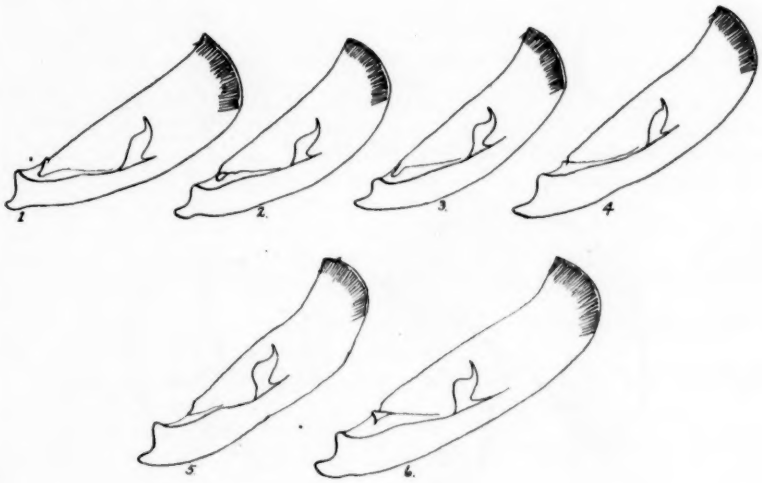
Primaries suffused with deep brown with a sprinkling of pale scaling, most distinct along inner margin. All maculation obsolescent with the exception of the s. t. line which stands out prominently on the dark background as

a series of white dashes preceded by fine blackish streaks. Secondaries much as in var. *manitoba*. In the male genitalia (fig. 3) the claspers are narrower and slightly longer than in *riparia* and *manitoba* and the harpe shows minor differences, consisting chiefly in the greater bulge below the apical hook.

*Holotype*—♂, Saskatoon, Sask., July 18, 1931, (K. M. King); No. 5215 in the Canadian National Collection, Ottawa.

*Allotype*—♀, same data, June 27.

*Paratypes*—2 ♂, same data, July 13, 1925, July 12, 1939.




Right Clasper of 1. *Oncocnemis riparia* Morr. (Long Island); 2. *O. riparia* var. *manitoba* var. nov. (Aweme, Man.); 3. *O. riparia* var. *subterminalis* var. nov. (Saskatoon, Sask.); 4. *O. riparia* var. *major* Grt. (Glenwood Spgs., Colo.); 5 *O. riparia* var. *aqualis* Grt. (?) (Steton Lake, B. C.); 6. *O. riparia* var. *deserticola* var. nov. (Morongo Valley, Calif.).

### **O. riparia** var. **deserticola** var. nov.

In general maculation of primaries with considerable similarity to typical *riparia*, the ordinary spots, basal streak and dark dashes preceding s. t. line being prominently outlined in white. The ground color is a dark gray, without any trace of brown and shows considerable whitish sprinkling.. The hindwings are opalescent white with no brownish tinges in the male and hardly any in the female; the outer smoky border is variable in width and intensity. In the male genitalia the clasper (fig. 6) is much longer and narrower than in *riparia*, the harpe is upright and very prominently bulging preceding the apical hook.

*Holotype*—♂, Morongo Valley, Calif., May 12, 1937, (G. and J. Sperry); No. 5216 in the Canadian National Collection, Ottawa.

*Allotype*—♀, same data, May 10.

*Paratypes*—2 ♀, same data as Allotype; 5 ♂, 4 ♀, Split Rock Tanks, Mohave Desert, Calif., May 20, 1938, (G. and J. Sperry); 1 ♂, Providence Mts., Calif., May 11, 1936, (G. and J. Sperry). A series of these will be deposited in the Sperry Collection.

This form has generally been going as *aqualis*, following possibly an

erroneous determination by myself. There is quite a possibility that it may prove to be a good species as I have found similar specimens with same type of genitalia in our collection from Eureka, Utah, mixed up with typical *major* from the same locality; it is probably one of these which was figured as *major* in the Barnes & McDunnough "Contributions", Vol. I (4), Pl. V, fig. 17. However, for the present I treat it as a race; its grayer color and prominent maculation easily separate it from other western forms.

## SOME NEW SPECIES OF THE GENUS *SCIARA* FROM CANADA*

BY F. R. SHAW,

Amherst, Massachusetts

In a collection of Mycetophilidae taken by H. E. McClure in Manitoba during the summer of 1936, there are two new species of the genus *Sciara*. The following are the descriptions of these new species.

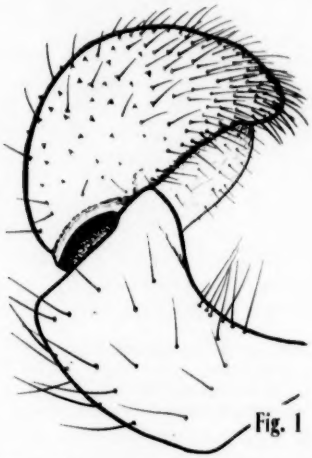


Fig. 1

Fig. 2

Figure 1. Ventral view of left dististyle of *Sciara macclurei*.
Figure 2. Ventral view of right dististyle of *Sciara bournei*.

### Sciara (Neosciara) macclurei n. sp.

*Male*. Length 2½ mm. This measurement is based on a specimen preserved in alcohol.

*Head*, including mouthparts and antennae, brown. Thorax dark brown. Legs yellowish brown. Wings hyaline. The base of the radial sector is slightly beyond the midpoint between the humeral crossvein and the tip of $R_1+_2$. $R_1+_2$ is proximad of the fork of media. The costa extends about .75 of the distance from $R_4+_5$ to $M_1+_2$. Petiole of cubitus more than .5 as long as the fused portion of media.

Abdomen, including the hypopygium, brown. Hypopygium (figure 1) with setae on either side of the median ventral line. Dististyles without prominent spines, resembling somewhat those of *Sciara jucunda* Joh. In Pettey's key

*Contribution from the Department of Entomology, Massachusetts State College, Amherst, Massachusetts.

this insect would run to *Sciara scita* Joh. but can be readily distinguished from *S. scita* by the structural differences of the dististyles.

Described from one male collected by H. E. McClure at Churchill, Manitoba, on July 10, 1936. Type in my collection.

I take pleasure in naming this insect for H. E. McClure.

**Sciara (Neosciara) bournei** n. sp.

*Male.* Length 2½ mm. This measurement is based on a specimen preserved in alcohol.

Head, including mouthparts and antennae, dark brown. Thorax dark brown. Legs yellowish at the base. Tarsi brown. Wings hyaline. The base of the radial sector is distad of the midpoint between the humeral crossvein and the tip of $R_1+_2$. $R_1+_2$ ends about .10 of the wing length proximad of the fork of media. The costa extends about .55 of the distance from $R_4+_5$ to $M_1+_2$. Petiole of the cubitus about .80 as long as the fused portion of the media.

Abdomen including the hypopygium (figure 2) brown. Dististyle with a strong terminal spine and a second similar spine on the mid dorsal surface. Each dististyle has, in addition, two weaker spines. There is no tuft of setae on the median ventral line near the base of the hypopygium.

In Pettey's key this species would run to *Sciara mutua* Joh. It can be distinguished from *S. mutua* by the structure of the dististyle. The structure and arrangement of the spines on the dististyle is wholly different for the two species.

Described from one male collected by H. E. McClure at Churchill, Manitoba, on July 7, 1936. Type in my collection.

I take pleasure in naming this species for A. I. Bourne whose kindly advice has often aided me.

In addition to the descriptions of the two new species of *Sciara*, I wish to record the collection of a specimen of *Exechia palmata* Johannsen, at Churchill, Manitoba, on July 10, 1936.

## BOOK NOTICES

### EMBRYOLOGY OF INSECTS AND MYRIAPODS

By O. A. Johannsen and F. H. Butt. McGraw-Hill Book Co., New York. Pages I-XI and 1-462, 370 figures. 1941. Price $5.00.

The senior author was, for a number of years, professor of insect embryology at Cornell University. On his retirement the junior author carried on this work. The present volume is their lecture course supplemented by material which it was found impossible to include in the prescribed course. In arrangement it follows the lecture course..

Part I, on the development of the tissues and organs of insects and myriapods, develops this phase of the subject under the following chapter headings: Introduction; A Type of Embryonic Development in Insects; The Egg, Fertilization, Maturation, and Cleavage; Early Development; Embryonic Envelopes, Dorsal Organs, and Blastokinesis; Gastrulation, Formation of the Germ Layers, and Development of the Ectoderm: The Alimentary Canal; Ectodermal Derivatives; Mesodermal Derivatives; Polyembryony and Pathenogenesis; Microorganisms in the Egg; Experimental Embryology.

In Part II the characteristic features of the different types of development are brought out by accounts of the embryology of individual insects representative of the main orders. The chapter headings in Part II are: Oligoentomata and Aptilota; Ephemerida, Odonata, Plecoptera, Embiaria, Dermaptera, and Hemiptera; Orthopteroidea (Panorthoptera); Oligonephridia; Neuroptera and

Coleoptera; Hymenoptera; Trichoptera and Lepidoptera; Siphonaptera and Diptera; Myriapoda.

The author has included reference lists at the end of each chapter and a bibliography of thirty-seven pages comprising almost 900 references. Only a small number of these references have not been examined by the authors.

For some time there has been a growing need for a text or suitable general reference covering this field of entomology. The present volume, judged on the basis of the authors' experience as well as the very careful manner in which the data have been assembled and the impartial attitude maintained on controversial questions, should certainly fill this need.

R. H. Ozburn

### ENTOMOPHAGOUS INSECTS

By Curtis P. Clausen. McGraw-Hill Book Co., New York. Pages I-X and 1-688, 257 figures. 1940. Price $7.00.

This volume is a comprehensive review of the subject. In its preparation, the author, who has had unparalleled experience in this field, has supplemented his own experience by data from approximately one thousand references. This list of references occupies forty-seven pages.

According to the author's estimate, there are 224 families in fifteen orders, the members of which are to some extent entomophagous in habits. In the table of contents of the present volume, sixteen orders are listed. It is not surprising, therefore, that the author has arranged the text matter under orders, and families in the case of the large orders, rather than under hosts, nature of parasitism, or other headings. For general purposes the text is very conveniently arranged.

Of the 612 pages devoted to general text matter, seventy-one families of Hymenoptera are considered in 340 pages. Of the remainder, some thirty-seven families of Diptera are considered in 142 pages, thirty-seven families of Coleoptera in sixty-one pages, the Strepsiptera in twenty-five, the Lepidoptera in thirteen, and eleven other orders the balance of the work.

Although the subject matter under each order begins with a general summary of habits and structures pertaining to the order, the actual space occupied by generalizations is very limited. The great bulk of this volume is a mass of pertinent facts. These facts are so ably selected and presented as to give a very complete picture or review of entomophagous insects.

The wealth of facts on the habits and life histories of insects contained in this volume make it indispensible to the modern entomologist.

R. H. Ozburn

### HOW TO MAKE AN INSECT COLLECTION

Ward's Natural Science Establishment, Inc., Rochester, N. Y., 32 pages, 38 figures. 1940. Price .15.

This little pamphlet, published by Ward's Natural Science Establishment, contains suggestions and hints to help the beginner make an insect collection. It is based on the experience of the members of Ward's entomological staff. Equipment, collecting, mounting, preserving, storing, shipping, and rearing insects are all considered, and the publication is profusely illustrated. This is a useful little pamphlet, whether the beginner be a student or a hobbyist.

R. H. Ozburn

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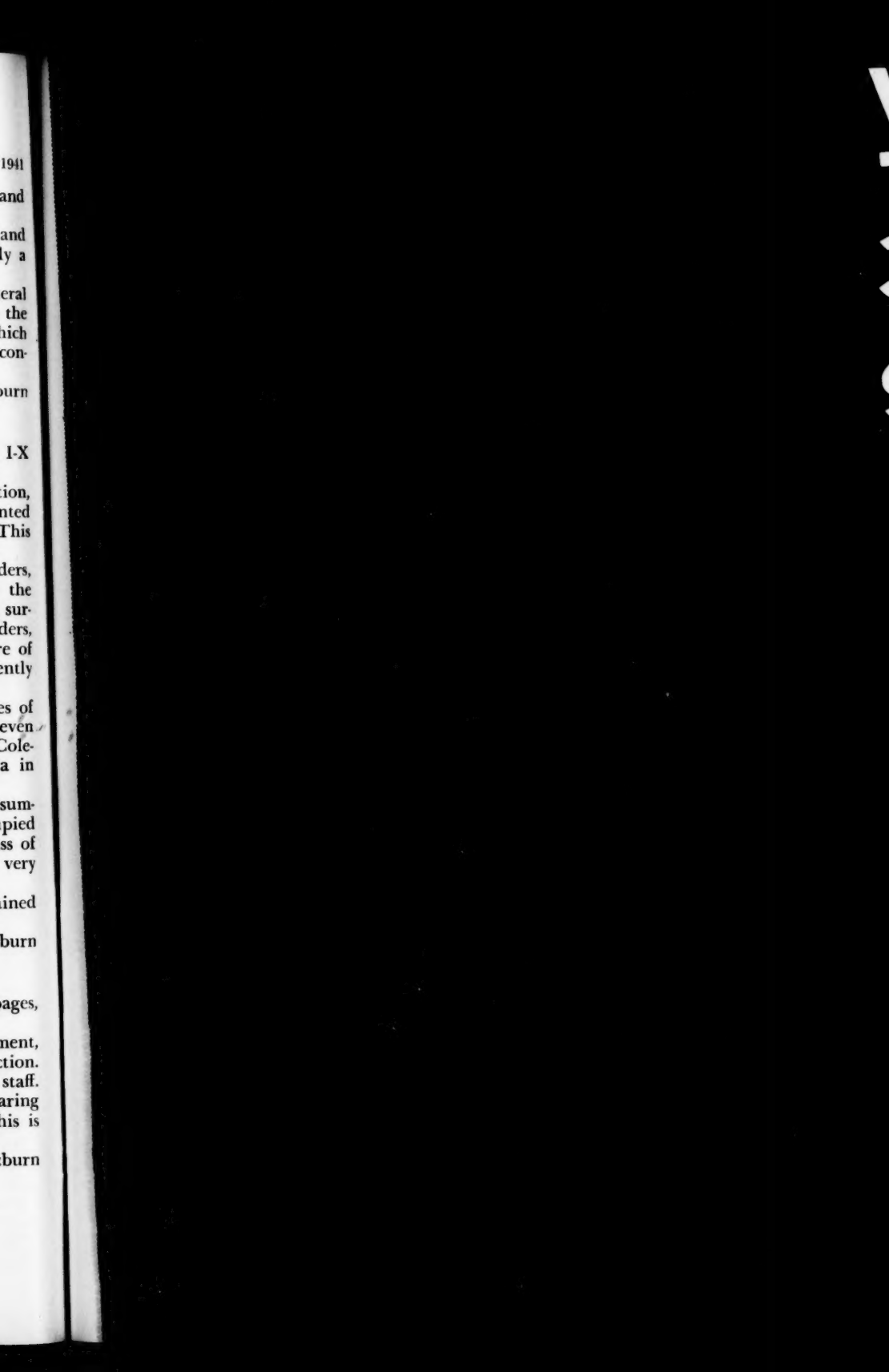
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